Claims

1. A process for producing isoprene, which comprises continuously or intermittently supplying isobutylene and/or t-butanol, formaldehyde and water into an acidic aqueous solution, and reacting the reaction mixture while distilling away a mixture comprising produced isoprene, water, unreacted starting materials and other low boiling point components from this reaction mixture to the outside of the reaction system, wherein said reaction is carried out while controlling the concentration of high boiling point byproducts, which is produced and accumulated in said reaction mixture, to fall within the range of 0.5 - 40 mass%.

2. The process according to claim 1, wherein the concentration of the high boiling point byproducts in the reaction mixture is controlled to fall within said range by forming an outlet/outlets for taking out the reaction mixture in a reactor containing the reaction mixture, taking out a part of the reaction mixture from the outlet, and separating and removing at least a part of the high boiling point byproducts from the reaction mixture, since then introducing the left reaction mixture again into the reactor.

3. The process according to claim 2, wherein the outlet for taking out the reaction mixture is formed at least in the bottom of the reactor.

4. The process according to claim 2 or 3, wherein the outlet for taking out the reaction mixture is formed in the side wall of the reactor, and the level of the outlet is set such that the volume of the reaction mixture filled to the level is not less than 1/2 of the total volume of the reaction mixture during the production of isoprene.

5. The process according to claims 1-4, wherein the mixture containing produced isoprene, water, unreacted starting materials and other low boiling point components is distilled away from the reaction system as a reaction distillation gas, water is fractionally condensed from the reaction distillation gas, and the obtained water is introduced into the reactor again to control the concentration of the high boiling point byproducts in the reaction mixture to fall within said range.

6. The process according to claims 1-5, wherein the concentration of the high boiling point byproducts in the reaction mixture is controlled to fall within said range by installing, on the reactor, a stirring apparatus having a stirring blade designed to horizontally rotate in the reaction mixture, and supplying isobutylene and/or t-butanol toward the stirring blade from an inlet formed by extending a pipe line to directly below the stirring blade in the reactor.

7. The process according to claims 1-6, wherein the concentration of the high boiling point byproducts in the reaction mixture is controlled to fall within said range by installing, on the reactor, a stirring apparatus having a stirring blade designed to horizontally rotate in the reaction mixture, in which a part of the reaction mixture is taken out from the reactor, heated with at least a part of isobutylene and/or t-butanol in a heat exchanger and introduced again into the reactor, and supplying the heated reaction mixture toward the stirring blade from an inlet formed in the reactor.